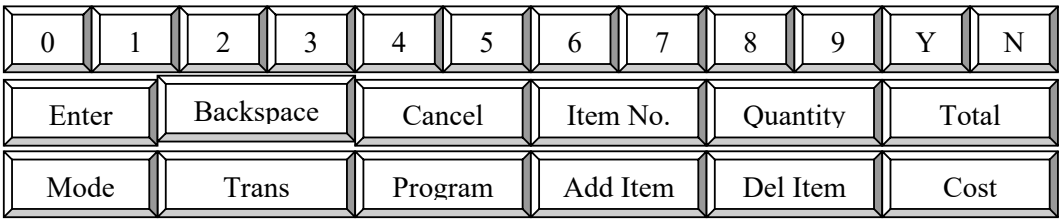
21.Cash Register

The system to be designed is a **Cash Register** a modified form of the one available in the institute cafeteria. The system is a stand-alone with inputs provides via a keyboard. Outputs are available via a LCD display. System gets power via the standard power outlet. System has chargeable battery available with it, that is used a battery back-up of the RAM. The battery charges itself when the system is on. A fully-charged battery has a life-time of 36 hours.

System Requirements

Keyboard

Format of the keyboard is shown below



Display

Display is a Liquid Crystal Display .Size of the Display is 16 x 1. (16 characters on one line).The LCD is connected to the micro-controller through a display driver in this case HD44780 which is available with the LCD

System Operation

- The system is Interactive in nature
- The system is provided security by a hardware lock. Only when the lock is open the system is functional.
- The lock system comes with a key. When the key is turned, the lock circuit gives a TTL high output else it gives a TTL low output.
- If the user presses a key on the keyboard when the lock is closed the system turns on a buzzer.
- At any point of time when the system is operational if the lock is closed the system must be disabled.
- A pulse of frequency 4 KHz turns on the buzzer. Buzzer is turned on for 1 Minute and then turned off.
- After the lock is open, the LCD is turned on and it displays “System Ready”.
- The user has to then press the **Mode** button on the keyboard. The LCD then displays “Select Mode”.
- The user can operate in any of the two modes **Transaction/ Program.** Transaction is the normal function and in the Program Mode, user is allowed to add new items and their cost.
- Every item has an item code and a cost associated with it.
- If the user presses the **Trans** key the system enters into transaction mode. The LCD displays “Enter Transaction Mode Y/N ?”.
- User then has to press **Y** to confirm. If user presses **N** it goes back to Mode Select display.
- In the Transaction mode user is expected to enter the item code and the quantity. Item code has to be entered using the **Item No**. key followed by the item code. The item code can be entered with the help of the numeric keys **0**-**9**. At the end of the item code the user has to press the **Enter** key. The item code will be then displayed on the LCD.
- User can press **Backspace** key to change the value of last key press or he can press **Cancel** to delete the whole entry.
- After the item code is displayed, user has to enter the quantity by pressing **Quantity** key followed by quantity of the item (using the numeric keys) a person wishes to buy and the **Enter** key.
- Automatically the total cost of the item will be displayed on the LCD.
- The user can continue entering all the items and finally press **Total** to display the total cost.
- In the Program mode user can add new items or delete an item. If the cost of an item is to be updated it has to first deleted and re-added to the item list in memory.
- When you add a new item you have enter the item number by using the **Item no.** key and the cost using the **Cost** key. After the cost has been keyed in the user must press **Enter**.
- The inter-active display will confirm your entry before storing it in the memory.

- If an item is to be deleted it is done using the **Del Item** key. Then user is required to press the **Item No** key followed by the item code and then press **Enter**.
- The inter-active display will confirm your entry before deleting it from the memory